

C L A I M S

1. Sluice vessel for feeding solid particulates into a pressurized pressure vessel, the sluice vessel having a low pressure state and a high pressure state, the sluice vessel comprising means for charging the sluice vessel with a load of the solid particulates when the sluice vessel is in its low pressure state, at least one discharge port, and pressurising means for increasing the pressure inside the sluice vessel by bringing a pressurising fluid into the sluice vessel, to bring the sluice vessel into its high pressure state before discharging the load via the discharge port, whereby the pressurising means comprises one or more pressurising fluid inlet means arranged to be submerged under the load of solid particulates.
- 10 2. Sluice vessel according to claim 1, wherein, during operation, an aeration fluid supply is fluidly connected to the one or more pressurising fluid inlet means to inject an aeration fluid from the aeration fluid supply into the load of the solid particulates while the discharge port is open.
- 15 3. Sluice vessel according to claim 1 or 2, wherein the pressurising fluid inlet means comprises a supply passage for transporting the pressurising fluid, the supply passage being connectable to a pressurisation device.
- 20 4. Sluice vessel according to claim 3, wherein the supply passage comprises a supply passage side wall that is provided with one or more openings, perforating the supply passage side wall, for allowing passage of the pressurising fluid from the supply passage into the
- 25 30 sluice vessel.

5. Sluice vessel according to claim 3 or 4, wherein the supply passage is a tubular supply passage.
6. Sluice vessel according to claim 5, wherein the tubular supply element extends in a substantially off-  
5 vertical direction.
7. Sluice vessel according to claim 6, wherein the one or more openings in the supply passage side wall face an upward direction.
8. Sluice vessel according to claim 5, 6, or 7, wherein  
10 the tubular supply passage extends along a longitudinal tube axis, and the discharge port is in alignment with the longitudinal tube axis.
9. Sluice vessel according to any one of the previous  
15 claims, wherein the pressurising fluid inlet means is provided with a distributor comprising a porous material, preferably made of a sintered metal, for supporting the solid particulates and allowing passage of the pressurising fluid.
10. Sluice vessel according to claim 9 when dependent on  
20 claim 3, wherein the distributor is mechanically supported by the supply passage for withstanding a pressure difference across the distributor corresponding to at least the pressure difference between the low pressure state and a high pressure state.
- 25 11. Sluice vessel according to any one of the previous claims, having a part with a downwardly converging wall forming at an apex thereof the at least one discharge port.
12. Sluice vessel according to any one of claims 3 to 11,  
30 wherein there is a discharge zone defined inside the sluice vessel which discharge zone stretches vertically above the discharge port, whereby the supply passage is provided outside the discharge zone.

13. Sluice vessel according to claim 11 or 12, wherein the pressurising fluid inlet means are arranged in, on, or close to the converging wall.

5 14. Sluice vessel according to any one of claims 11 to 13, wherein the pressurising fluid inlet means are arranged to bring the pressurising fluid into the sluice vessel in a direction facing away from the converging wall.

10 15. Method of operating a sluice vessel for feeding solid particulates into a pressurised pressure vessel, the sluice vessel comprising at least one discharge port, wherein the sluice vessel is brought from a low pressure state to a high pressure state, comprising the steps of:  
15 charging the sluice vessel with a load of the solid particulates when the sluice is in its low pressure state;

20 bringing the sluice vessel into its high pressure state, before discharging the load via the discharge port, by bringing a pressurising fluid into the sluice vessel thereby increasing the pressure inside the sluice vessel;  
whereby at least part of the pressurising fluid is brought into the sluice vessel via one or more pressurising fluid inlet means submerged under the load of solid particulates.

25 16. Method according to claim 15, further comprising the step of discharging the load via the discharge port, while aerating the load by allowing a flow of an aeration fluid through the one or more pressurising fluid inlet means.

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17. Method according to claim 16, wherein the aeration fluid is actively injected into the load of the solid particulates, whereby preferably one or both of a selected pressure and a selected volumetric rate of the aeration fluid is controlled.